DOCUMENT RESUME

ED 094 876 PS 007 377

AUTHOR Rancourt, Karen L.
TITLE A Study to Compare Quantitatively the Amount of Change in Facial Expression of Pre-Schoolers and Kindergarteners in Situations Lacking Contact with Another Person and in Social Situations. Occasional Paper No. 5.
INSTITUTION Maryland Univ., College Park. Center for Young Children.
PUB DATE Jun 72
NOTE 18p.; For other papers in the series see PS 007 374-380

EDRS PRICE MF-$0.75 HC-$1.50 PLUS POSTAGE
DESCRIPTORS Age Differences; Analysis of Variance; *Classroom Observation Techniques; *Classroom Research; Hypothesis Testing; *Kindergarten Children; *Nonverbal Communication; *Preschool Children; Reliability; Statistical Analysis; Tables (Data)
IDENTIFIERS *Facial Expression

ABSTRACT

This report presents an investigation of three hypotheses concerning facial expressions in young children: (1) children seem to emit the same number of changes in facial expressions when they are alone as when they are in contact with another person; (2) the number of facial expressions made when children are along, compared with when they are in contact, with another person, does not vary with age between 4-, 5-, and 6-year-olds; and (3) there are no differences in the number of facial changes made between boys and girls when they are alone and when they are with another person. A total of 15 4-, 5-, and 6-year-olds were observed watching soundless animal movies in a natural classroom setting. An observer quantitatively recorded all changes in facial expression made by each subject as he viewed the movies both by himself and with a friend. Results confirmed only the second hypothesis, and showed that the children studied did make more facial expressions when accompanied by a friend than when alone and that the girls made significantly more facial changes than the boys. (SDH)

ED 094876.

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Center for Young Children
Occasional Paper Number Five

A STUDY TO COMPARE QUANTITATIVELY THE AMOUNT OF CHANGE IN FACIAL EXPRESSIONS OF PRE-SCHOOLERS AND KINDERGARTENERS IN SITUATIONS LACKING CONTACT WITH ANOTHER PERSON AND IN SOCIAL SITUATIONS

Center for Young Children
College of Education
University of Maryland
June 1972

PS 007277

Karen L. Rancourt, the author of this paper, was a graduate student in the Department of Early Childhood-Elementary Education when she conducted this study. She utilized the facilities of the Center for Young Children in carrying out this investigation of facial expressions and their relationship to emotional communication.

TABLE OF CONTENTS

	Page
INTRODUCTION	1
RELATED RESEARCH	2
NULL HYPOTHESES	5
DELIMITATIONS	5
DEFINITIONS	5
PROCEDURE	6
STATISTICAL ANALYSIS	7
FINDINGS	8
SUMMARY	11
DISCUSSION AND CONCLUSION	13
FOOTNOTES	15

Introduction

A limited amount of research is available in the area of facial expressions and their relationship to emotional communication. As Davitz points out, most of the studies were conducted in the 1920's and thirties; then research in this area decreased for the next couple of decades, probably as a result of the war activities. Then during the 1950's to the present, researchers once again became interested in the study of facial expressions.[1]

Interestingly enough, the work done under Davitz's auspices stemmed from researchers merely asking what they considered pertinent and relevant questions, but there is no hypothetico-deductive framework from which hypotheses studied have evolved.[2] In other words, a researcher raised questions and worked with them merely on the basis of interest. The following questions were of interest to this researcher, and this study was designed and developed to study and to investigate them.

1. Do children seem to emit the same number of changes in facial expressions when they are alone as when they are in contact with another person?

2. Does the number of facial expressions made when they are alone as compared with being in contact with another person vary with age among pre-schoolers and kindergarteners?

3. Are there any differences in the number of facial changes made between boys and girls when they are alone and when they are in the presence of another person?

Related Research

It appears that in the general area of emotional communication (and more specifically in the area of facial expressions for purposes of this study), all available data were collected from laboratory studies. This means that at those times during which data were being collected, the subjects most probably were aware that they were involved in studies, and this may or may not have had a bearing on the findings. Nevertheless, it can at this time be stated that "Individuals indeed differ in their ability to communicate, but notwithstanding these individual differences, our results demonstrate incontrovertibly that nonverbal, emotional communication is a stable, measurable phenomenon."[3]

In 1872 Charles Darwin suggested that "Endowed . . . with the function of communication, they (facial expressions) survived from one stage of animal evolution to the next and thus were passed along the evolutionary ladder to man."[4] In this sense it becomes apparent that facial expressions as a mode of communication have not become operable as the result of the socialization of man but rather that they have helped to make it possible for man to progress socially as far as he has. The work of Darwin also points out that the use of facial expressions is not a mode of communication possessed solely by or limited to man.

It would appear then that the use of facial expressions is found throughout the higher order species and it becomes of prime importance to consider under what circumstances they are used. Blau found in his work that "For some people, and perhaps in some situations, the emotional meaning of a message is of primary importance; whereas other people consciously recognize emotional meanings only when instructed to do so."[5] Davitz points out that little is known about what cues are responsible for eliciting

emotional responses[6] and Schachter and Singer suggest that emotional states are defined, in part, by situational cues.[7] We know that infants often babble incoherently and incessantly, and we assume that they do this in order to experiment with and improve upon their vocal abilities. The cues for this process are often internal in source since a baby will begin babbling for no apparent reason, or at least there does not seem to be any outward change in the environment. If we know that infants babble for purposes other than communication with others, it is consistent with this fact to question if young children use facial expressions independent of human contact. In other words, do young children use facial expressions strictly as a mode of communication with others, or are facial expressions perhaps also used as a form of self-communication?

Fields found in his work that throughout childhood there is a steady growth in the ability to understand other people's emotional feelings expressed nonverbally,[8] and Fulcher concludes that many emotional expressions are natural and universal such as smiling, but that through learning children are able to make these expressions more meaningful and effective.[9] Kwint has found that as children grow older they become more adept at communicating to others how they feel using a whole range of gestures and nonverbal emotional expression.[10]

It is apparent then that utilizing nonverbal expression including facial expression is a type of skill that seems to improve with maturity and training, but at this point the literature offers very limited insight as to whether this nonverbal usage is limited to social interaction or if it also functions independent of social interaction. Stated differently, the available data do confirm the consistent use of facial expressions in social interaction, but at this point the data do not offer insights as to

the use of facial expression in situations lacking social interaction.

It was the focus of this study to investigate this facet of the use of facial expression in pre-schoolers and kindergarteners. Children of this age range were studied because the researcher felt that this is the stage of initial social interaction with peers in larger numbers than the more limited interactions a child has in the home and neighborhood.

Null Hypotheses

The following null hypotheses were formulated to guide this study:

Null Hypothesis #1: Children seem to emit the same number of changes in facial expressions when they are alone as when they are in contact with another person.

Null Hypothesis #2: The number of facial expressions made when children are alone and compared with when they are in contact with another person does not vary with age between four, five, and six-year olds.

Null Hypothesis #3: There are no differences in the number of facial changes made between boys and girls when they are alone and when they are in the presence of another person.

Delimitations

Four, five and six-year old children were used in this study. Five children of each age group were studied. All S_s attended the Center for Young Children at the University of Maryland, and all children were observed in their "natural habitat"--that being their classrooms which are equipped with observation booths. The observations were recorded quantitatively with no qualitative interpretations attached.

All subjects were volunteers.

PS 007372

Definitions

1. Change in facial expression--any visible transformation, alteration, modification or assuming of a facial manifestation of feeling which is not physiological in nature such as sniffing, coughing, blinking, or twitching. Examples of a change in facial expression: eyes widening, pouting, mouth opening widely, cheeks puffing out.

Procedure

1. A small area opposite the observation booth was screened off (to afford some isolation within the classroom situation) in each of the two classrooms with four, five, and six-year old children.

2. "KODAK SUPER 8" units were set up with a variety of filmloops all pertaining to animals. The units are strictly visual and each filmloop lasts approximately 3 1/2 to 4 minutes. A timer was used so that each observation was 3 minutes in duration.

3. Each classroom teacher announced the availability during choice play of the equipment and interested children were told that they could ask a student teacher to help them get situated in the booth and to start the projector running.

4. Before starting the equipment, each subject was told that he could watch one loop by himself and then if he wanted to, he could watch a second one with a friend. Only those children who requested to have a friend join them for a second loop were observed for purposes of this study.

5. An observer recorded in tally form all changes in facial expression for both the viewing a subject did by himself and also for the viewing the smae subject did with a friend. The tallies were kept quantitatively with no attempt at a qualitative analysis.

6. After a total of five children from each age group had been observed, the data were treated statistically.

7. Two observers worked together on some of the observations to obtain inter-coding reliability.

Statistical Analysis

Null Hypothesis #1: The data from the total sample was tabled in terms of number of changes in facial expression when "Viewing Alone" and when "Viewing with A Friend." Using a .05 level of significance, the "two-independent-samples t test" was calculated and applied to compare group means.

Null Hypothesis #2: A one-dimensional analysis of variance was calculated and applied using a .05 level of significance.

Null Hypothesis #3: A one-dimensional analysis of variance was calculated and applied using a .05 level of significance.

Findings

Null Hypothesis #1: The data from the total sample were tabled in terms of number of changes in facial expression when "Viewing Alone" and "Viewing with A Friend." The data are summarized for the "two-independent-samples t test" in Table I.

TABLE I

SUMMARY OF DATA FOR ENTIRE SAMPLE "VIEWING ALONE" AND "VIEWING WITH A FRIEND"

Statistics	"Viewing Alone"	"Viewing with a Friend"
n	15	15
$\bar{X}$	7.4	17.9
S^2	34.24	119.13
S	5.85	10.91

The calculated "t" statistic computed = 5.807

With 28 degrees of freedom the critical value = 2.048 at the non-directional .05 level. Consequently, Null Hypothesis # 1 was rejected and it was concluded that for this sample there are significant differences between the number of changes in facial expressions made when "Viewing Alone" and "Viewing with A Friend."

Null Hypothesis #2: A one-dimensional analysis of variance was calculated and applied to test the null hypothesis that the number of facial expressions made when children are alone and compared with when they are in contact with another person does not vary with age between four, five, and six-year olds.

The data are summarized in Table II.

TABLE II

SUMMARY OF ANALYSIS OF VARIANCE TABLE FOR COMPARING FOUR, FIVE, AND SIX-YEAR OLDS "ALONE" AND IN "CONTACT"

Source	Degrees of Freedom	Sum of Freedom	Mean Square	F
Treatment	2	264.6	132.3	1.116
Error	12	1421.8	118.48	-
TOTAL	14	1686.4	-	-

n=15

The calculated F value = 1.116. With 2 and 12 degrees of freedom the critical value = 3.8853 at the non-directional .05 level. Consequently, Null Hypothesis #2 was accepted and it was concluded that for this sample the number of facial expressions made when children are alone and compared with when they are in contact with another person does not vary with age between four, five, and six-year old children.

Null Hypothesis #3: A one-dimensional analysis of variance was calculated and applied to test the null hypothesis that there are no differences in the number of facial changes made between boys and girls when they are alone and when they are in the presence of another person.

The data are summarized in Table III.

TABLE III

SUMMARY OF ANALYSIS OF VARIANCE TABLE FOR COMPARING GIRLS AND BOYS "VIEWING ALONE" AND "VIEWING WITH A FRIEND"

Source	Degrees of Freedom	Sum of Squares	Mean Square	F
Treatment	1	446.4	446.4	4.682
Error	13	1240.0	95.38	-
TOTAL	14	1686.4	-	-

n=15; $\bar{X}$ difference for girls = 12; $\bar{X}$ difference for boys = 20

The calculated F value = 4.682. With 1 and 13 degrees of freedom the critical value = 4.6452 at the non-directional .05 level. Consequently, Null Hypothesis #3 was rejected and it was concluded that there is a difference in the number of facial changes made between boys and girls when they are alone and when they are in the presence of another person.

A comparison of the mean differences for the boys and girls shows that for this sample the girls made a significantly greater number of facial changes than did the boys.

Summary

It was found from studying the facial expressions of fifteen four, five, and six-year old children at the Center for Young Children at the University of Maryland that these children seemed to emit a significant difference of facial expressions when they were alone as compared with when they were in contact with another person. The calculated "t" statistic for making this comparison was 5.807 and with 28 degrees of freedom the critical value at the non-directional .05 level is 2.048. Consequently, Null Hypothesis #1 which reads as follows was rejected: Children seem to emit the same number of changes in facial expressions when they are alone as when they are in contact with another person. By comparing the means and variances for the sample (see Table I), it is apparent that these children used a significantly greater number of facial expressions in that situation involving the presence of another person.

It was found in comparing the number of facial expressions made "Alone" and in "Contact" (with another person) did not vary significantly by age. In other words, an analysis of variance (comparing the means of each age level) showed that one age group did not seem to use more facial expressions than any other age group. The calculated F value for this test was 1.116 and with 2 and 12 degrees of freedom the critical value at the non-directional .05 level was 3.8853. Hence, Null Hypothesis #2 which reads as follows is accepted: The number of facial expressions made when children are alone and compared with when they are in contact with another person does not vary with age between four, five, and six-year olds. This, in fact, was the finding for the sample used in this study.

In comparing the numbers of facial expressions made by the boys with the numbers of facial expressions made by the girls, significant differences were found. The calculated F value for the analysis of variance was 4.682. With 1 and 13 degrees of freedom the critical value at the non-directional .05 level is 4.6452. Consequently, Null Hypothesis #3 which reads as follows was rejected. There are no differences in the number of facial changes made between boys and girls when they are alone and when they are in the presence of another person. A comparison of the mean differences for the boys and girls showed that for this sample the girls made a significantly greater amount of facial changes than did the boys.

A sample Pearson product-moment correlation coefficient was computed yielding an inter-coder reliability of .89.

Discussion and Conclusion

Within the last decade or so there has been a great interest shown by educators and behavioral scientists in the area of nonverbal communication. (Note such contributions as Body Language by Julius Fast, The Silent Language by Edward T. Hall, and The Communication of Emotional Meaning by Joel R. Davitz.) The potential and impact of nonverbal behavior is now recognized and accepted and the result has been that more studies are now being conducted in this area. It is a vital area in terms of understanding as it becomes more apparent that human beings are constantly giving off nonverbal cues and interpreting other people's nonverbal cues. Facial expressions are but one facet in the complex realm of nonverbal behavior; and research is still meager.

Darwin pointed out that the use of facial expressions is not limited to man but can be seen to function throughout the mammal species. (See footnote 3). This, of course, means that future research need not be confined to the study of man, but rather that investigating other species might be an aid in the attempt to study human behavior, especially, if it is approached in evolutionary terms.

The results of this study show that facial expressions are used in situations lacking a social framework but they are used primarily and to a significantly greater extent in situations involving contact with another person. It might be tentatively concluded that facial expressions are used primarily as a mode of communication with others and perhaps secondarily as a mode of self-communication. This is merely hypothesizing. Further research is deemed necessary in this area.

The work of Fields and Fulcher (See footnotes 8 and 9, respectively) show that although some expressions such as smiling are universal, there

does seem to be throughout childhood a steady growth in the ability to understand other people's emotional feelings. It would seem logical, therefore, to conjecture at this time that because the functioning of facial expressions in social situations has been established that perhaps children could be given systematic help in utilizing their own facial expressions more effectively. The question then might become: In what ways can educators and behavioral scientists help children give off intended nonverbal cues and in what ways can children be helped to be aware of and to interpret nonverbal cues emitted by other people? The finding in this study that the girls seemed to use a significantly greater number of facial expressions than did the boys in the sample raises some interesting possibilities for further research. A worthwhile hypothesis might be: Do girls seem to use more facial expressions than boys in other samples? If so, is this phenomena cultural, biological, social, or some combination of these three in origin?

Regardless of the specific direction taken, it is apparent that much research is needed in nonverbal behavior. Facial expressions are a part of this total behavior and it is through analyzing the parts that understanding the whole might be attained.

FOOTNOTES

[1]Joel R. Davitz, The Communication of Emotional Meaning (New York: McGraw-Hill Book Company, 1964), p. 27.

[2]Ibid., p. 192.

[3]Charles Darwin, The Expression of the Emotions in Man and Animals (Chicago: University of Chicago Press, 1965).

[4]Davitz, op. cit., p. 178.

[5]Ibid., p. 179.

[6]Ibid., p. 28.

[7]S. Schachter and J. Singer, "Cognitive, Social, and Physiological Determinants of Emotional State," Psychological Review, Vol. 69, 1962, pp. 379-399.

[8]Sidney L. Fields, "Discrimination of Facial Expressions and Its Relation to Personal Adjustment," American Psychologist, Vol. 5, 1950, p. 309.

[9]J. S. Fulcher, "Voluntary Facial Expressions in Blind and Seeing Children," Archeological Psychology, No. 272, 1942.

[10]L. Kwint, "Ontogeny of the Motility of the Face," Child Development, Vol. 4, 1934, pp. 1-12.